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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consist of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

ED 059302

TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

LABORER, POULTRY 8-09.01

3-238 or S-26

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STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY FOR LABORER, POULTRY 8-09.01

8-29

Summary

The entire GATB, except Part E, was administered in August, 1951 to 72 women employed as Laborer, Poultry 8-09.01 at Swanson and Company, Fayetteville, Arkansas. The criterion consisted of supervisory ratings. The aptitudes found to be significant for the job were Finger Dexterity and Manual Dexterity.

GATB Norms for Laborer, Poultry 8-09.01

Table I shows the minimum acceptable score for each aptitude included in the test norms for Laborer, Poultry 8-09.01.

TABLE I

Minimum Acceptable Test Scores for 8-1001

Aptitude	Tests	Minimum Acceptable Aptitude Score
F	CB-1-O CB-1-P	85
M	CB-1-M CB-1-N	85

Effectiveness of Norms

The data in Table V indicate that 10 of the 18 poor workers, or 56% of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. This shows that 56% of the poor workers would not have been hired if the recommended test norms had been used in the selection process. Moreover, 42 of the 50 workers who made qualifying test scores, or 84%, were good workers.

TECHNICAL REPORT

I. Problem

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Laborer, Poultry 8-09.01.

II. Sample

The sample consisted of 72 women employed as Laborer, Poultry 8-09.01 at Swanson and Company, Fayetteville, Arkansas. These employees worked interchangeably on the jobs within the plant. The plant titles for the various jobs are Oil Sac Remover, Pinner, Crop Puller, Back Splitter, Vent Cutter, Head Cutter, Drawer, Giblet Cutter, Giblet Cleaner, Lung Puller, Neck Cutter, Internal Wash, Turner, Feet Cutter, Inspector, Wing Cutter, Saw Operator, Leg Cutter, Giblet Wrapper, Bottom Maker, Packers, Adjust Scales, Cellophane Wrapper, Cover Maker, and Check or Final Weigher.

Table II shows the means, standard deviations, ranges, Pearson product-moment correlations (corrected for broad categories) with the criterion, and the standard errors of correlation for age, education and experience.

TABLE II

Means (M), Standard Deviations (σ), Ranges, Pearson Product-Moment Correlations (Corrected for Broad Categories) with the Criterion ($_{c}r$), and the Standard Errors of Correlation (σ_{cr}) for Age, Education and Experience

Laborer, Poultry 8-09.01
N=72

	M	σ	Range	cr	σ_{cr}
Age (Years)	35.500	10.746	18-54	-.097	.117
Education (Years)	9.014	2.024	4-13	.084	.117
Experience in Plant (Mos.)	30.000	24.001	5-147	.142	.115

Since there is no significant correlation between age, education, or experience with the criterion, these factors are evidently not influencing the supervisory ratings. The means, standard deviations, and ranges do not indicate that age, education, and experience are operating as selection factors for the job.

III. Job Description - Laborer, Poultry 8-09.01

Job Summary: Dresses and packs poultry, performing any combination of the following duties: removing oil sac, removing pin feathers, crop pulling, splitting backs, removing vents, cutting off heads, removing viscera, cutting giblets, cleaning and washing giblets, pulling lungs, cutting necks, internal washing, turning chickens, cutting feet, inspecting, cutting wings, sawing in half, leg and thigh cutting, giblet wrapping, box making, packing, adjusting weights, cellophane wrapping, and final check weighing.

Work Performed:

1. Removing oil sac: Turns chicken, which is being conveyed on continuous chain, to right position, removes oil sac, using small sharp knife, and drops oil sac in tray below chicken.

2. Pinning: Removes pin feathers from chicken by scraping with knife.

3. Crop Pulling: Slits open front end of abdominal cavity, using knife, reaches into cavity and removes crop, cutting and breaking connective tissues, drops into tray beneath chicken.

4. Splitting backs: Splits backs of chickens from anus to neck, using knife, to facilitate removal of viscera.

5. Vent cutting: Cuts around anus of chicken, using knife, to facilitate removal of viscera.

6. Cutting off heads: Removes the heads from chickens, using a pair of snips, drops head into tray below chicken.

7. Drawing: Removes viscera from chicken by reaching in through opening in back and breaking the connective tissues, drops viscera into tray below chicken from which giblets are later removed.

8. Cutting giblets: Removes the liver, heart and gizzard from viscera, using scissors and being careful not to include gall baldder on liver. Places giblets in tray to be cleaned.

9. Cleaning and washing giblets: Cuts heart and gizzard open, using knife; washes in vat of water; removes inner lining of gizzard by pressing into a machine; washes all parts of giblets and places in tray preparatory to subsequent wrapping.

10. Lung pulling: Pulls the lungs, kidneys and connective tissues from the chicken, using a scraper instrument.

11. Cutting necks: Removes neck from the chicken, using a pair of hand snips; drops neck into tray to be wrapped with giblets.

12. Internal washing: Washes inside of chicken, using a high-pressure water hose, directs water stream into chicken to remove blood, loose pieces of lung, etc.

13. Turning chickens: Removes chicken's feet from conveyor and hangs chicken by one wing to facilitate the removal of feet.

14. Cutting feet: Removes feet from chicken by cutting between the knee joint, using a hand knife, drops feet into vat below work table.

15. Inspecting: Inspects chickens to see that they are properly cleaned, removes any foreign matter left in chicken, paying particular attention to kidneys or parts of lungs left in chicken.

16. Cutting wings: Removes both wings from chicken, using knife to cut between joints; places wings and chicken in conveyor tray.

17. Sawing in half: Pushes chicken against band saw blade to divide into halves by sawing through breast, turns parts and saws between breast and thigh leaving leg and thigh together, returns parts to tray.

18. Cutting legs: Removes leg and thigh pieces from tray; places pieces on work bench; separates leg and thigh, using knife to cut between joints; returns pieces to tray.

19. Giblet wrapping: Removes one each, heart, liver, gizzard, and neck from washing trays, places on oil paper on work bench, wraps and stacks on work area.

20. Making box bottoms: Folds carton blank, manually, interlocking corners by means of tabs; places sheet of cellophane on box and places box on conveyor belt.

21. Packing: Removes parts of one complete chicken from tray and wraps giblets from work area; places chicken and giblets in carton in a uniform arrangement so that skin side of each piece is visible; pushes carton onto conveyor belt.

22. Adjusting scales: Removes carton of chickens from conveyor belt and places it on balance scales; interchanges parts from extra parts tray to make carton weigh within one-half ounce of one of four specified weights; returns carton to conveyor belt.

23. Cellophane wrapping: Slides carton from belt to bench; folds cellophane over chicken, lifts chicken from the carton, folds cellophane under and places chicken back into carton; pushes carton back onto belt.

24. Making box covers: Folds carton cover blank manually, interlocking corners by means of tabs; places cover on belt near carton.

25. Final check weighing: Removes carton from conveyor; places carton on scales and marks weight on carton, using crayon pencil; returns carton to conveyor.

IV. Experimental Battery

All of the tests of the GATB, with the exception of Part E, were administered to the sample group.

V. Criterion

Supervisory ratings were used as the criterion. They are the combined ratings of two foreladies and the personnel manager given at different times. The 25% of the sample who were considered the best workers were given A ratings, the middle 50% were given B ratings, and the lowest 25% were given C ratings. These qualitative values were converted to numerical scores of A=63, B=50, and C=37 in order to compute the product-moment correlations corrected for broad categories.

VI. Statistical and Qualitative Analysis

Table III shows the means, standard deviations, Pearson Product-moment correlations (corrected for broad categories) with the criterion, and standard errors of correlation for the aptitudes of the GATB. Table IV shows the means, standard deviations, standardized means, standardized standard deviations, Pearson product-moment correlations (corrected for broad categories) with the criterion, and standard errors of correlation for each test of the GATB.

The means and standard deviations of the aptitudes and the standardized means and standardized standard deviations of the tests are comparable to general population norms with a mean of 100 and a standard deviation of 20.

TABLE III

Means (M), Standard Deviations (σ), Pearson Product-Moment Correlations (Corrected for Broad Categories) with the Criterion ($_{c}r$), and the Standard Errors of Correlation (σ_{cr}) for the Aptitudes of the GATB

Laborer, Poultry 8-09.01
N=72

Aptitude	M	σ	$_{c}r$	σ_{cr}
G Intelligence	88.875	17.610	.238	.111
V Verbal Aptitude	88.778	17.258	.222	.112
N Numerical Aptitude	83.736	20.509	.421	.097
S Spatial Aptitude	94.583	16.214	.032	.118
P Form Perception	86.347	18.978	.086	.117
Q Clerical Perception	78.944	16.415	.247	.111
A Aiming	95.931	24.081	.269	.109
T Motor Speed	87.917	21.961	.227	.112
F Finger Dexterity	99.194	19.025	.503	.088
M Manual Dexterity	100.028	17.315	.560	.081

TABLE IV

Means (M), Standard Deviations (σ), Standardized Means (M'), Standardized Standard Deviations (σ'), Pearson Product-Moment Correlations (Corrected for Broad Categories) with the Criterion ($_{c}r$) and Standard Errors of Correlation ($\sigma_{_{c}r}$) for each Test of the General Aptitude Test Battery

Laborer, Poultry 8-09.01
N=72

Test	M	σ	M'	σ'	$_{c}r$	$\sigma_{_{c}r}$
A Tool Matching	17.333	5.925	87	21	.108	.116
B Name Comparison	49.944	16.415	79	16	.247	.111
C H Markings	45.375	9.479	104	26	.162	.115
D Computation	19.986	7.990	83	21	.447	.094
F Two-Dimensional Space	19.736	8.623	93	21	.249	.111
G Speed	127.903	25.293	92	24	.031	.118
H Three-Dimensional Space	15.861	5.396	95	16	-.024	.118
I Arithmetic Reason	6.819	3.084	89	18	.312	.106
J Vocabulary	15.708	7.968	89	17	.223	.112
K Mark Making	63.903	10.270	85	21	.339	.099
L Form Matching	22.069	6.134	89	16	-.007	.118
M Place	89.528	7.161	104	16	.555	.082
N Turn	98.125	8.390	93	19	.400	.099
O Assemble	27.708	4.224	100	18	.511	.087
P Disassemble	28.417	3.601	98	20	.338	.104

The statistical results were analyzed in the light of significant aptitude requirements as indicated by the job analysis. Aptitudes F and M show the greatest significance in the job analysis. The job consists mainly of various handling and cutting tasks. These aptitudes also have the greatest significance statistically. They have the highest mean scores and the highest correlations for this sample, and their standard deviations are below the general population standard deviations. The correlations with the criterion of both aptitudes F and M are significant at the 1% level.

Aptitudes A and T, which appear to be involved in the job to a certain extent, do not seem as important on the basis of job analysis as aptitudes F and M. Moreover aptitudes A and T do not appear to be as significant statistically, and do not discriminate effectively within the sample. Aptitude N, which has a high correlation with the criterion, is not evident in the job analysis data.

Based on all the foregoing considerations, aptitudes F and M were chosen for inclusion in the test norms. The minimum scores were set approximately one standard deviation below the mean and adjusted to the nearest five point levels

yielding best differentiation between good and poor workers. This resulted in test norms consisting of aptitudes F and M, each with a minimum score of 85.

In order to compute the tetrachoric correlation coefficient and chi square, the criterion was dichotomized between the supervisory ratings of B and C. Thus the high group consists of workers receiving ratings of A and B and the low group consists of workers receiving C ratings. Table IV shows the relationship between test norms consisting of aptitudes F and M, each with a critical score of 85, and the criterion, dichotomized between B and C, for Laborer, Poultry 8-09.01. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers".

TABLE V

Relationship between Test Norms Consisting of
Aptitudes F and M, each with a Critical Score of 85,
and the Criterion with a Critical Score of 50
for Laborer, Poultry 8-09.01

N=72

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	12	42	54
Poor Workers	10	8	18
Total	22	50	72

$r_{tet} = .53$ $\qquad$ $X^2 = 5.585$

$\sigma_{r_{tet}} = .21$ $\qquad$ $\frac{p}{2}$ .01

The data in the above table yielded a tetrachoric correlation coefficient of .53 with a standard error of .21, and a chi square value of 5.585 which yields a $\frac{p}{2}$ value of less than .01. These results indicate that there is a significant relationship between the recommended test norms and job performance for this sample.

VII. Conclusions

On the basis of all the foregoing considerations, it is recommended that aptitudes F and M, each with a critical score of 85, be used as test norms for the occupation of Laborer, Poultry 8-09.01.